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## RECENT LITERATURE

**Bresslau, Ernst.** THE MAMMARY APPARATUS OF THE MAMMALIA IN THE LIGHT OF ONTOGENESIS AND PHYLOGENESIS. WITH A NOTE BY J. P. HILL. London: Methuen & Co. Pp. i-vii, 1-145, with 47 illustrations. 1920.

This splendid book is a résumé of the author's extensive investigations on the development of the milk-glands and related structures in mammals and on the evolutionary history of the mammary apparatus. The subject is divided into three chapters describing the development of the mammary organs in the three principal groups of mammals, Monotremata, Marsupialia, and Placentalia.

The development of the mammary apparatus does not begin with the arrangements for the accomodation of the young, i.e. with the formation of the pouch, but much earlier, with structures which the author terms primary-primordia, that is, gland areas. These are followed in *Echidna* by the development of the incubatorium and at last by mammary glands. The gland areas act as a hindrance to the extension of the developing panniculus carnosus muscle immediately after birth. Thus there remains an oval, muscle-free area on the ventral side of the trunk which later develops into the incubatorium. In *Ornithorhynchus* the incubatorium is absent, most likely an adaptive feature in this aquatic animal. The marsupium or pouch in marsupials is in no way to be compared with the incubatorium of *Echidna*. It arises as the result of developmental processes in the epidermis which lead to the formation of so-called marsupial pockets, which are entirely unrepresented in *Echidna*. The great apparent similarity of incubatorium and marsupium in the adult animals rests solely on convergence. Among the Didelphyidae there are many pouchless forms in which a marsupium never existed. No pouch rudiments can be found in the Placentalia, since a pouch stage is not included in the phylogenesis of this group.

The original nipple is represented by the simple type of eversion nipple which forms the common point of departure for the evolution of the marsupial as well as of the placental nipples. This type arises from the nipple pouches, discovered by Morgan, the final nipple appearing through eversion of the pouch. Another type, the so-called proliferation nipple, is formed through the involution of the nipple pouch stage. Here the nipple wall is formed essentially by the cutis, the apical portion only by the original primordia; whereas in the first mentioned type of nipple almost the entire epithelial covering is furnished by the original primordia. The so-called milk-streaks of placental embryos are homologous to the primary-primordia of monotremes and marsupials. From these milk-streaks spring the nipples and milk-glands of the Placentalia and their development is much like that in marsupials.

The interesting discussions on the number and arrangement of nipples in marsupials, on the specializations of this organ in placentals, on the mammary hairs, and other related questions do not lend themselves for further condensation in this review. It is to be regretted that some of the illustrations are not better reproduced.

—A. H. Schultz.

**Michelssohn, G.** DIE HAUTMUSKULATUR DES IGELS (*ERINACEUS EUROPAEUS*). Morphol. Jahrb., vol. 51, pp. 147-229. 1921.

A careful, detailed description of the cutaneous musculature of the hedgehog, *Erinaceus europæus*, and a comparison of these muscles with related structures in